



COLONY AND PROTECTORATE OF SIERRA LEONE

ANNUAL REPORT
OF THE
Department of Agriculture
FOR THE YEAR
1943

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The Annual Report of the Department of Agriculture, for 1943

SIR,

I have the honour to submit my report for the year 1943.

SECTION I (a).—INTRODUCTION AND POLICY.

2. The department continued its wartime policy of directing a vigorous campaign and supplying the necessary seed and advice to increase production of food, especially rice, particularly for the feeding of the large numbers of labourers employed on various service works in and around Freetown.

3. The experience of the previous year had shown the difficulties of collecting sufficient rice to feed this large collection of people, and special efforts were made to offset the decrease in production, which might normally be expected to take place owing to decreased man-power in the Protectorate due to recruiting soldiers and labour, by stimulating production and increasing the capacity to produce of those left on the farms. The area of upland farms that can be brushed is limited by the fact that brushing can only take place during a comparatively short season of the year, but the farmer's capacity for producing rice can be augmented by inducing him to make swamp farms as well as upland farms, since the time limits within which an upland farm must be made are not the same as those for swamp farms and a man can first prepare his upland farm and then set about making a swamp rice farm.

4. While, therefore, farmers were encouraged to ensure the greatest area of upland crops by early brushing an energetic campaign was carried out to induce the cultivation of more swamp farms. In the Bo Division, with the enthusiastic co-operation of the Commissioner, Mr. L. W. Wilson, native administrations were persuaded to make large farms, the scheme being financed from native administration funds and the work of clearing and planting being carried out by contractors. In this way some 1,600 acres of extra swamp land were cultivated.

5. In the Kenema Division a different scheme was adopted with the active co-operation of the Commissioner, Mr. A. Burns. Each village was asked to make swamp farms and to plant an area equivalent to one-twelfth of a bushel of seed per house, but the response was such that this department distributed at least three times as much seed as that originally anticipated. Both of these schemes were therefore successful and both resulted in the production of more rice than originally anticipated but whereas the Kenema rice scheme has left behind no new problems, the native administration schemes in the Bo District leaves behind the very interesting problem of what is to be done with the cleared farms. Should they be maintained as "chiefdom" farms, or are farmers to be settled on these farms on agreed terms and the native administrations develop fresh swamps each year? This matter is now under consideration.

THE HONOURABLE,
THE COLONIAL SECRETARY,
FREETOWN.

6. In addition to these schemes in the Bo-Kenema Divisions the Agricultural Department prosecuted its "grow more swamp rice" campaign throughout the Protectorate to such an extent that 21,835 bushels of seed rice were distributed under the many schemes now supervised by this department. This is a new record for Sierra Leone and exceeds the previous record (made last year) by 30 per cent. As a result of all this propaganda the rice crop was probably larger than it has ever been.

7. In the Scarcies area the irrigation and drainage branch reclaimed some 2,100 acres of land at Rosino and Luti, but the reclamation was not completed early enough for the 1943 crop to be materially affected. Work was also commenced on the Yakban scheme an area of some 4,000 acres before the end of the year.

8. *Food Crops other than Rice.*—Continued attention has been paid to the production of foodstuffs such as yams, cassava, sweet potatoes, maize, and vegetables and these have resulted in increasing quantities coming on to the market. Freetown market is now supplied with greater quantities of vegetables than at any time since the war started. The presence of cassava in the country was amply demonstrated when during the shortage of rice immediately before the 1943 harvest the Government purchased cassava, foofoo, and farina and placed them on the Freetown market as substitutes for rice.

9. The policy of the department has remained unchanged but certain activities have been restricted by shortage of staff and the necessity of concentrating on mass production of foodstuffs. Comparatively little new work has been started, but, as is customary in the annual reports, I give below the policy approved by Government and the work initiated or extended by the department during the year under each head of the policy:—

A.—THE ADEQUATE PROVISION OF FOOD FOR THE PEOPLE.

This is to be accomplished by:—

I. *The improvement and spread of swamp rice cultivation to such an extent that not only will the needs of the people be supplied in a bad year but there will be a surplus for export in ordinary years.*

Work initiated or extended in 1943.

- (i) *Swamp Reclamation.*—2,100 acres reclaimed at Rosino and Luti in the Scarcies area. Ten acres of salt swamp bunded and demonstrated as suitable for growing rice in Maswari area.
- (ii) Forty-three inland swamps totalling approximately 1,600 acres cleared by native administrations in the Bo area.
- (iii) Seed distribution from native administrations and departmental schemes extended and a total of 21,835 bushels of swamp rice seed of improved varieties were distributed.
- (iv) *Irrigation and Drainage Work.*—Apart from (i) reconnaissances and survey work for the reclamation of large areas has been proceeded with in the Scarcies area and to a less extent in some inland areas.

II. *The better cultivation of inland swamps and valleys for rice during the wet-season and crops other than rice during the dry-season.*

The work at Makeni and Kenema has been developed and now begins to demonstrate the improved methods of cultivating valleys and their adjacent hillsides in Sierra Leone.

III. *The extension of garden and small-field crops.*

No new work.

IV. *The selection or introduction and distribution of seeds and plants suitable for I and II.*

Considerable quantities of vegetable seeds were imported.

V. *Improvement of Poultry and Stock.*

The scheme envisaged last year was approved during 1943 but difficulty was experienced in recruiting a Veterinary Officer. Improvements have been made on the livestock farm and the service of a Veterinary Officer is now available to combat diseases.

B. THE CULTIVATION OF MONEY CROPS OR THE EXPLOITATION OF WILD TREE CROPS FOR EXPORT PURPOSES.

Considerable propaganda has been undertaken to increase palm kernel collection.

C. THE ARRESTING OF THE DEGRADATION OF FOREST GROWTH OR AT ANY RATE INCREASING THE REGENERATION PERIOD BETWEEN SUCCESSIVE BRUSHINGS OF THE SAME AREA.

No new work.

D. THE IMPROVEMENT IN THE PREPARATION AND MARKETING OF PRODUCE.

The four new Planters' mills mentioned in the last report have now been installed.

E. THE PRESERVATION OF THE STANDARD OF EXPORT PRODUCE BY INSPECTION.

No new work.

F. CO-OPERATION WITH THE EDUCATION DEPARTMENT WHERE POSSIBLE IN THE TEACHING OF AGRICULTURE.

No new work, but a scheme is being drawn up to extend the activities of the Njala Training College.

G. RESEARCH.

Except for that carried on with types of swamp rice at Rokupr and preliminary investigations with pasture grasses at Njala, it has not been possible to carry out any serious research work.

H. CONSERVATION OF SOIL.

2,100 acres of swamp land reclaimed in the Scarcies area and work on a further 4,000 acres commenced.

I. NUTRITION.

No new work.

J. EXTENSION WORK. ALL EXTENSION WORK AND PROPAGANDA MUST BE BASED ON INFORMATION GAINED FROM EXPERIMENT, OR FROM EXPERIENCE BY AGRICULTURAL OFFICERS IN SIERRA LEONE.

No new stations or areas opened in 1943.

(b). GENERAL REVIEW OF CROPS INCLUDING EXPORTS.

10. The year 1943 proved a good year for upland crops and in spite of the shortage of farmers due to recruiting for the Services and service works, the production of food crops appears to have reached a normal level.

11. *Rice*.—In view of the considerable propaganda undertaken it is extremely gratifying to be able to record that a good rice crop was harvested. This, if not a record crop, was not far from it.

12. Other local foodstuffs and fruits continued to be produced on a considerable scale. Of the substantial quantities that reached Freetown about 45 per cent came from the Railway line area and the remainder from the Scarcies and Port Loko creeks and the Bullom shore.

13. *Export Crops*.—In view of the requirements of the United Kingdom an effort was made to increase the collection of palm kernels, an industry which had fallen off owing to the lack of demand for kernels during the first 2 or 3 years of the war. Good results attended the effort and the target figure was nearly reached. Palm oil supplies were fair but not good. Owing to the local demand for vegetable oils the price of palm oil for local consumption was much higher than that offered by exporting firms and no palm oil was exported. Piassava supplies were always in excess of the shipping available for transport and the purchase of the fibre was restricted. Ginger was again purchased by Government. The price was advanced to £40 a ton but only a small crop was marketed. The kola crop was small and there was some difficulty in obtaining supplies at the control price owing to wholesale smuggling into French Guinea.

SECTION II—THE WORK OF THE AGRICULTURAL DEPARTMENT—ORGANISATION AND STAFF.

14. The headquarters of the department remained at Njala throughout the year, but work in connection with food supply and membership of numerous committees necessitated the presence of the Director of Agriculture in Freetown for part of his time. It was, however, possible for the Director to carry out a number of tours in the Protectorate when the majority of the agricultural stations were regularly visited. The head office at Njala was in the charge of the Senior Agricultural Officer styled "Assistant Director", for the first half of the year; unfortunately circumstances necessitated the absence on leave of both Senior Agricultural Officers simultaneously in the second half of the year, during which time the Plant Pathologist acted as Assistant Director of Agriculture.

15. A considerable strain was put on the department by the serious shortage of European staff. One of its more senior Agricultural Officers was invalided through ill-health; the Agricultural Officer in charge of the agricultural course at the Njala Training College resigned his appointment, one vacancy remained unfilled; and although two officers were appointed to fill vacancies they did not arrive until December. One Agricultural Officer already overdue for leave, was employed almost entirely from June to December on palm kernel production propaganda. As a result of this shortage of Agricultural Officers the Entomologist had to be diverted from his normal duties and he acted as an Agricultural Officer throughout the year. There was also a considerable amount of ill-health due to long hours in swampy areas.

16. Thus while the establishment of the field branch of the department remained at two Senior Agricultural Officers and thirteen Agricultural Officers, for several months in the middle of the year only seven Agricultural Officers were in the country, imposing a severe strain on the remaining staff to maintain existing stations and organise increased food production.

Research work was, in accordance with His Excellency's instructions, relegated to the background and only certain work already in progress at Rokupr and Njala could be continued.

17. The establishment of the African field branch of the department stood at seventy-three. A second post of Junior Agricultural Assistant was created; and there were thirty-six instructors in the first grade and thirty-five in the second. It was found impossible to recruit further staff for training in view of the low rates of pay and late in the year Government approved of new grades for the African technical staff of the department, with rates of pay which would bring the new grades into line with corresponding appointments in the other technical departments. The new grades and rates take effect as from January 1944.

18. The irrigation and drainage and the produce inspection branches had their headquarters in Freetown. The staff of the former was considerably augmented; details are to be found in the section of this report which deals with the work of the irrigation and drainage branch.

19. *Food Production.*—The increased production of rice, the staple food of the country, again received priority of attention from all Agricultural Officers but propaganda for the production of vegetables and especially green vegetables, was vigorously pursued.

20. *Rice.*—Two important schemes were initiated by the native administrations of the Bo and Kenema Divisions. The Bo Division scheme aimed at the clearing and cultivation by the native administrations of large areas of swamp within a ten-mile radius of Bo. This was later extended to include areas in the Pujehun and Moyamba Districts. Forty-three swamp areas totalling just under 1,600 acres were cultivated in this manner. These swamp farms all produced rice of good quality, high yielding varieties and in their first year were very successful. This scheme was fathered by the Administration and without their assistance could not have been carried out. The reclaimed land where not previously cultivated belongs to native administrations and the problem of their future cultivation and development will need a great deal of further consideration both from Administrative and Agricultural Officers. In the Kenema Division increased production was achieved through the medium of section and village communal farms. The aim here was the planting of one extra bushel of seed for every twelve houses in the division. While the actual increase in the acreage under rice could not be ascertained it is known from the amount of seed supplied by the Agricultural Department that the target was exceeded at least three times.

21. *Seed Distribution.*—There was a further increase in the number of revolving schemes operated by native administrations. A total of 21,835 bushels of seed rice was distributed under all seed schemes—a record amount 30 per cent higher than the 1942 distribution which was itself a record. These seed schemes were initiated in 1935 with the aid of a small grant from the Colonial Development and Welfare Fund and in that year ninety bushels were distributed. The mushroom growth of these seed distribution schemes in all areas where they are started is almost unbelievable. Farmers are most eager to obtain varieties of rice of better quality and yield than those at present generally available and the department is filling a long felt want in its distribution of good varieties,

22. *Sembehun Loan Scheme.*—The work continued to be restricted by lack of staff and a shortage of labour for clearing mangrove forest. £491 was issued in the form of loans to farmers for clearing mangrove making a total of £3,700 of loans since the inception of the scheme. 383 acres of mangrove were cleared which brought the total area cleared under the scheme to just short of 4,000 acres. Lack of launch transport for the Agricultural Officer in charge of Sembehun still hampers work in this area.

23. *Food Crops other than Rice.*—The scheme for increased food production in the Kisi chiefdoms with funds provided by the Protectorate Mining Benefits Fund came to an end, having achieved its purpose. The area is now well supplied with a considerable variety of food crops including the better kinds of sweet cassava, yams, Chinese yams, sweet potatoes, legumes of various kinds, bananas and pineapples. Sugar cane is being grown with a view to extraction trials later.

24. Large quantities of subsidiary food crops such as cassava, sweet potatoes and yams were produced during the year. This has been made possible by the wide distribution of planting material undertaken by the Agricultural Department; for example, over 10,000 lb. of seed yams were distributed to farmers in forty-two chiefdoms by the Agricultural Officer, Makeni alone. This increase in root crops proved very useful during the recent rice shortage.

25. The production of native-type vegetables continued to increase, and in no market town of any size is there now a shortage of these commodities. The production of European type vegetables has also been stimulated by propaganda and distribution of seed. A food production campaign was inaugurated during the year in the Colony and an African Agricultural Instructor was specially detailed to advise and help small holders in market gardening and to do everything possible to stimulate vegetable production. Large quantities were supplied to the troops quartered here and to merchant vessels passing through the harbour.

26. *Cattle.*—The livestock farm passed into the control of the Veterinary Department at the beginning of the year, but it was soon apparent that this move was premature and that the Veterinary Department had not the staff or the experience in Sierra Leone to run the farm. The farm, therefore, reverted temporarily to the Agricultural Department towards the end of the year. The livestock farm presents two problems, the first is the improvement of the stock by breeding and selection and the second the creation of suitable pasturage, the making of silage and the raising of suitable food crops. The second problem is one to which the department is giving considerable attention and it is entirely an agricultural one. The officer in charge has therefore to be a man with an agricultural training who has studied animal breeding and an officer who has these qualifications has been placed in charge of the livestock farm.

AGRICULTURAL STATIONS.

NJALA AGRICULTURAL STATION.

27. Very little investigational work was possible apart from that connected with yield records of perennial crops including oil palm, citrus and coffee. The annual cropping blocks were given over to the production of food for livestock.

28. Large numbers of fruit trees and plants of economic species were again distributed from the nurseries. These included over 2,000 budded citrus plants, 2,507 other fruit trees, 3,583 oil palms, 1,850 coffee, 132 budded mangoes. Over 5,300 ornamental plants were distributed though the further propagation of these has practically ceased for the period of the war.

29. In view of the growing importance of animal husbandry in the economy of this country increasing attention is being paid to pasture grasses and fodder crops. Trials on small upland plots have been carried out with guinea grass, elephant grass, *Andropogon tectorum* and Uba cane.

30. *Andropogon* is the most palatable, with Guinea and elephant grass following; Uba cane is apparently not so much liked by cattle. *Andropogon* is, however, regarded as unsuitable because of its tussock-like habit which does not check soil erosion; because of its low out-turn of fodder in comparison with the other grasses tried and because it does not produce green fodder during the dry season as do Guinea grass and elephant grass and Uba cane. Both Guinea grass and elephant grass will give at least three cuts of fodder a year and still supply a small amount of dry season grazing: they have the advantage of a spreading habit and form wide clumps, and Guinea grass seems promising as a rough pasture grass. Trials with Uba cane are less advanced: its growth habit seems to be suitable.

31. *Pueraria phaseoloides* (Rhodesian kudzu) is still the best leguminous fodder (and cover) crop yet tried in Sierra Leone. It has given three good cuts of fodder a year, the last of which has usually been made into hay. It does not provide much green fodder during the dry season later than about the end of January, after which date most of the leaves fall. Trials of mixtures of elephant grass and Uba cane with *Pueraria* have been unsuccessful as the *Pueraria* smothers the grasses.

32. Kikuyu grass was introduced from South Africa in 1942 and spread well in an upland plot during the rainy season, but almost died out in the dry season. An attempt will be made to find more suitable sites for further trials.

33. Neither Kikuyu grass nor Guinea grass are found capable of withstanding inundation on low-lying ground subject to flooding in the rains.

34. *Livestock*.—The health of the breeding herd of cattle and of the work oxen was satisfactory. The breeding herd was severely culled to remove animals not conforming to type.

35. A small flock of sheep was maintained.

36. Pigs suffered severely from the attacks of intestinal worms. This is likely to be a limiting factor to the rearing of pigs for pork and bacon. The assistance of the veterinary authorities has been sought in order to overcome this difficulty.

37. Work with poultry was continued on the lines of past years. 197 breeding fowls and over 500 hatching eggs were distributed.

38. With only one Agricultural Officer available from June onwards for extension work in the whole of the Kenema Division and the Bo and Pujehun Districts it became necessary for the officer in charge of head office

to assist in supervising work in Bo and Pujehun Districts. This supervision was perforce restricted to a great extent to the scrutiny of reports of Agricultural Instructors working in the districts. The work has since (1944) been added to the activities of the Agricultural Officer in charge of Njala Agricultural Station who can cope with it only by delegating more and more of the supervision of that station to the senior African Agricultural Instructor.

39. Altogether forty-three swamp-farming schemes were run by native administrations in Bo and Pujehun Districts and in the Njala Circle of Moyamba District. These schemes totalled 1,577 acres. Some difficulty was experienced in getting the necessary labour to clear and cultivate the swamps thoroughly. In a small number of cases swamps of somewhat low fertility were chosen. Nevertheless, this native administration farming venture has been successful and has been the means of producing over a thousand tons of rice of superior quality.

ROKUPR AGRICULTURAL STATION.

40. Investigational work comprised a comparative yield trial of six introduced varieties of rice and one selection from a local variety. A cultivation experiment which has now been in progress for four years has shown that at Rokupr digging gives a considerable increase in yield over no cultivation and that digging eight inches deep is more effective than digging four inches deep. Similarly, early digging (February) is more beneficial than digging just before planting in July.

41. High-yielding selections of local rices were multiplied for distribution to seed farms. It is noteworthy that Rokupr selections from local rices are among the highest yielders on the station and this grading up of local rices is a line of work which has certainly proved well worth while. It becomes more and more obvious that the widespread distribution of these selected rices is having an important effect on the yield from the Scarcies region and elsewhere in the country.

42. Five farmer's co-operative societies continued to operate in the Scarcies, but without much vitality. Agricultural Officers have not been able to give sufficient time to fostering the movement during the period of the war and the general control of prices by Government and the restrictions on the movement of rice have limited the activities of the societies.

43. The small breeding herd of pigs that was started in 1942 has not so far been successful. This was entirely due to the fact that the original sows were some of a batch of ill-bred, unthrifty animals obtained for the department by the Army, with a view to pork production for the Services. A bad set-back was experienced by this introduction after a most promising start had been made by the department on an experimental scale in crossing the Berkshire breed with the local breed of black pigs.

SEMBEHUN AGRICULTURAL STATION.

44. No experimental work was undertaken and operations on the farm were hindered by a serious shortage of labour in the area.

45. Piricularia disease made its appearance in the upland rice nurseries in late June, all varieties under cultivation being affected.

46. With the aid of heavy dressings of compost satisfactory crops of yams (12,000 lb. per acre), sweet potatoes and groundnuts were taken off the poor upland blocks of the farm. An interesting experiment was the composting of the town refuse and its application to a swamp; an increase of over 75 per cent in the yield resulted, and a marked residual effect in the succeeding year is apparent.

47. Because of the dearth of traders in many parts of the area, the department had to undertake much of the buying of native-cleaned rice under the Government's chiefdom quota scheme to ensure rice supplies for essential services. District work had therefore to be curtailed. The need for a second Agricultural Officer for the heavy work in this large circle is as great as ever. Activities are still restricted by the absence of suitable river transport.

48. Progress was also restricted under the mangrove clearance loan scheme by the continued shortage of staff. 131 farmers received £491 in loans which enabled them to clear 383 acres. Since the commencement of the scheme 940 farmers have received loans amounting to £3,700 and just under 4,000 acres of mangrove forest have been cleared.

49. Over 1,500 bushels of seed rice were distributed under departmental and native administrations seed schemes and another thousand bushels of pure seed were supplied for distribution by the department in other areas.

50. After a difficult start through labour shortage a successful rice farming venture was undertaken by the Banta Native Administration. This was largely due to the encouragement given to it by the Agricultural Officer and the District Commissioner and it resulted in the harvest of a good crop of rice from 240 acres of inland swamp.

MAKENI AGRICULTURAL STATION.

51. This farm was financed from the Protectorate Mining Benefits Fund till the end of 1943; it will be a charge against the departmental vote in the future. It has now been laid out as a demonstration of the department's methods of improving agriculture by cultivation of the valley bottoms for annual food crops and the hill sides with tree crops. With the aid of the irrigation and drainage branch the course of Mayanki stream flowing through the farm has been realigned with a view to the provision of irrigation water in 1944 for the larger part of the arable area of the farm.

52. A small head of stock including twelve oxen has been maintained. Compost is made on a modified Indore system and with the aid of this, and water control, it is hoped to improve the fertility of the land which at the outset was low.

53. The rice on the farm plots yielded twenty-three bushels to the acre compared with an average yield in the preceding year of eighteen bushels.

54. In the upland area there are established blocks of permanent crops of which the more important are bananas, oil palm, citrus, coffee and coconuts. Pineapples and pawpaws are also grown successfully.

55. From the nurseries there were distributed free or on sale 250 kola, 1,000 robusta coffee, 500 oil palm, and a considerable number of other economic plants including breadnut, citrus, pin apples, pawpaws and various fruit trees. There is a large demand for these in the circle served by Makeni Farm and every effort is being made to meet it in 1944.

56. The production of vegetables of both European and native-type was encouraged and seeds were distributed.

57. Batkanu sub-station was maintained as a demonstration and seed centre. It was enlarged slightly to improve its amenities. A pair of working oxen was kept and greater control over the water supply has also been effected.

58. Nursery gardens have been maintained by two native administrations and a promising start with a swamp-farming venture has been made by the Safroko Limba Native Administration.

59. Native administration seed schemes have made steady progress in the three years during which Makeni Agricultural Circle has been in existence. Sixteen native administrations are now operating such schemes with eleven approved varieties of rice and 2,142 bushels of seed were in circulation during the year.

60. Departmental revolving schemes for seed rice and yams have also maintained steady progress. 3,406 bushels of seed rice were distributed in forty-seven chiefdoms while 10,000 lb. of seed yams were distributed in forty-two chiefdoms.

61. A trial with seed of *Cinchona succirubra* and *Cinchona ledgeriana* was undertaken. No germination resulted at Makeni, but at Kabala a few seedlings were raised. In similar trials at Njala and Kenema no germination was obtained. It is unlikely that cinchona can be successfully grown in Sierra Leone.

KENEMA AGRICULTURAL STATION.

62. The farm was extended and now includes twenty-five acres of swamp and twenty-two of upland. Work has been planned with a view to demonstrating improved methods of valley cultivation which are considered to be well within the capabilities and reach of the average farmer.

63. A number of varieties of rice were successfully grown in the water-controlled plots with a view to providing pure seed supplies for native administration farms. Crops grown on the upland blocks included three varieties of yam, groundnuts and vegetables of European and native-type. Citrus and other fruit trees were planted.

64. Small number of livestock include two working oxen, five cows, and four calves, nine sheep and four goats. The health of all these was satisfactory. A small flock of poultry is also kept.

65. Pigs suffered from the effects of lung and intestinal parasites. The pig stock at the end of the year totalled nineteen.

66. Work in both the agricultural station and circle suffered from the ill-health of the Agricultural Officer and of members of his staff. It was not possible to post more than one Agricultural Officer to this important circle nor to supply a relief when this officer was sick.

67. The drive for increased rice production which is described in an earlier section of this report achieved great success, more than three times the amount of seed estimated to be required for the extra planting effort being distributed. The amount distributed represented one extra bushel of seed for every four houses in the division.

68. Five farms are run by native administrations in Kenema District and three in Kailahun District. Their principal aim has been the growing of rice, but several other crops including bananas, pineapples and yams have been grown on the higher ground adjoining the swamp. Each of these farms will in future include a definite area of the swamp to be used as a pure seed farm for demonstration of methods of cultivation and of varieties of rice suited to different conditions; the pure seed so obtained will be distributed to farmers in the chiefdom.

NEWTON AGRICULTURAL STATION.

69. This farm serves as a centre from which extension work is carried out in the greater part of the Colony Peninsula and in a number of the more adjacent chiefdoms of the Port Loko District.

70. In addition to the established plots of cinnamon, cashew, mangoes and avocados, a block of pawpaws was planted. These bore abundantly before the end of the year.

71. The irrigated vegetable gardens in the East Valley was extended and improved. Satisfactory crops of certain of the European-type vegetables were grown with the help of dressings of farmyard compost mixed with wood ash, burned oyster shell and rice bran. 210 lb. of vegetable seeds were distributed, as well as 158 small packets of seeds.

72. Newton is the largest of the department's pig-raising centres. The stock reached a total of over 200 animals at one period of the year and at the end of the year it comprised six boars (five recently introduced from the Veterinary Department, Nigeria), seven sows, and seventy head of young stock of all ages up to twelve months. Numerous obstacles to the successful raising of pigs on a commercial scale remain to be overcome. By far the greatest is the intestinal round worm for which a suitable treatment will have to be found before pig-keeping can be safely recommended. A further important difficulty is feeding, especially in war-time when cassava which normally would be the cheapest foodstuff is, on a dry weight basis, 50 per cent more expensive than rice in the Colony Peninsula.

73. A small number of breeding cattle are maintained the principal object at the present stage being the training of the staff in animal management.

74. There are three sub-stations in the Colony Circle—one at Maswari where an experiment in rice-growing in an empoldered area is in progress, one at Port Loko, and one at Lunsar near Marampa.

75. *Maswari—Reclamation of Saline Swamps.*—This is the most important work of this station. The swamps in question, some three or four miles from Newton, are covered with salt water at high spring tides and the land in its natural state is therefore worthless. When totally empoldered and drained it has been found suitable for rice growing. One or two years are needed to work out the salt and obtain good crops; thus

Sughandi in an old empolder gave a yield of twenty-eight bushels per acre whilst in a new empolder (the first crop grown and in the second year after empoldering) the yield from the same variety was 10·3 bushels per acre. As soon as a chemist can be obtained a thorough study of the salt problem will be undertaken.

76. Variety plays a great part in the yields from these areas. Of the varieties tried Sughandi is by far the most promising.

77. Important possibilities are believed to be in store for Sierra Leone in this new system of rice farming and a further 100 acres will be cleared in this area for cultivation with a view to the use of mechanical cultivators when such can be obtained.

78. The following crops were distributed for planting from Port Loko sub-station :—Yams, Canary bananas, sweet cassava, citrus and avocados; and from Lunsar: cassava, "Mississippi" sweet potatoes, Canary bananas.

79. Under departmental and native administration revolving seed schemes 646 farmers benefited by the supply of 1,245 bushels of seed rice under the former and 856 bushels under the latter.

TEKO STOCK FARM.

80. The control of this farm passed from this department to the newly-created Veterinary Department at the beginning of the year, the Livestock Officer being transferred to the new department, but it was obvious before the year was out that the meagre staff of the Veterinary Department (Director with Headquarters in Gambia, one Veterinary Officer, one Livestock Officer and no trained African staff) could not cope adequately with problems of animal husbandry, so important from the agriculturist's point of view, nor yet with the management of Teko Stock Farm, and Government has since agreed to the management of the farm by the Agricultural Department until such time as the Veterinary Department is in a position to take it over.

81. The stock farm is now beginning to show results, a notable one being the increase in weight of calves at birth. This was about 30 lb. per calf when the farm first started and has now risen to 40 lb. This improvement is due to the better feeding and selection of stock. Similarly there are indications of improved milk yields.

82. Pig-rearing ceased at Teko early in the year as a result of the heavy losses of animals from trypanosomiasis.

83. At the end of the year an Agricultural Officer and two Agricultural Instructors and three temporary instructors were stationed at Teko, while three temporary instructors are on loan to the Veterinary Department as inoculators.

RESEARCH—PLANT PATHOLOGY.

84. The Plant Pathologist returned from leave at the end of March, and except for a short period in April and May he was attached to the head office for the rest of the year, acting as Assistant Director of Agriculture from 13th July to December 7th.

85. The department suffered a regrettable loss by the death in November of the Junior Mycological Assistant, Mr. M. B. Kallon.

86. A pamphlet on " Diseases of Cultivated Plants in Sierra Leone " for departmental use was prepared by the Plant Pathologist in April and printed at the end of the year.

87. There has unfortunately been a fresh outbreak of citrus scab in the past two years during which the services of the Plant Pathologist were not available to this department. The disease was first reported in the Makeni area and it was then found on several trees at Njala. Steps are being taken to stamp out this fresh outbreak.

88. Potatoes (*Solanum tuberosum*) grown by the provincial administration at Kabala from Nigerian seed were inspected in September. About 90 per cent of the plants were seen to be infected with one or other of four virus diseases, and a high proportion of plants were affected by bacterial wilt (*Bacterium solanacearum* presumably).

ENTOMOLOGY.

89. The Entomologist acted as an Agricultural Officer throughout the year. His Laboratory Assistant worked at Njala under the Entomologist in charge of the citrus moth investigation.

90. With the assistance of the Colonial Development and Welfare Fund grant for investigations on fruit piercing moths, Mrs. F. J. Jordan worked throughout the year with headquarters at Njala Agricultural Station. Details of the work accomplished are the subject of special quarterly reports.

RICE MILLING.

91. The Government rice mill at Cline Town operated most successfully, though under great pressure of work, throughout the year.

92. Revenue collected at the mill and credits outstanding at the close of the year amounted to over £144,133. A profit of £1,660 was realised on the year's working of the mill. In this figure the profit or loss is restricted to the working of the mill and does not include the profit or loss on the rice for which the mill merely acts as a store and clearing house.

93. Four small planters' mills were installed at Rokupr, Kenema, Bo and Sembahun respectively. Those at Rokupr and Sembahun were used to a limited extent at intervals during the year, but the Kenema and Bo mills were not used beyond testing them owing to the fact that paddy was not available for milling until after the harvest at the end of the year. Preliminary tests have shown that these small hullers are capable of producing a good sample of milled rice from paddy of a high standard of purity which has been parboiled before hulling.

PRODUCE INSPECTION.

94. The work of the produce inspection branch came under two main heads; that immediately concerned with the inspection of produce for export, the normal duty of the branch, and special work resulting from war conditions including purchase of rice, the purchase and railment of local foodstuffs, and efforts to increase the production of palm kernels. For these special duties the staff of the branch was augmented by the appointment of five temporary sub-inspectors of produce.

95. The inspection branch also handled (including purifying) some 10 tons of beeswax received from the northern districts for export.

96. The number of produce licences issued in the Freetown Police District alone created a new record, 749 being issued. This more than doubled the previous year's figure.

97. Mr. C. G. White, Sub-Inspector of Plants and Produce, Grade I, acted as Inspector of Plants and Produce from the end of January until the end of the year in the absence of the substantive holder of the post who was seconded to the Supplies Department.

AGRICULTURAL EDUCATION.

98. The training of Agricultural Instructors at Njala continued. Ten agricultural apprentices completed the third year section of a four-year course. In addition one Agricultural Instructor from the Gambia completed a two-year course. There was no Agricultural Officer available to take over the duties of Mr. M. J. Douglass, Agricultural Officer in charge of the agricultural course, who resigned early in the year and the agricultural training at the College was in the hands of the Technical Assistant, Mr. G. C. Taylor. Owing to the lack of attraction in the rates of pay of the junior staff of the department, compared with some other departments, it was impossible to recruit a new class of students. New scales of salary have now been approved by Government and this difficulty removed.

99. The Agricultural Staff at the College also undertook a course of nature study for the fifteen student-teachers in training and a one-year course for five forestry students.

100. The training scheme at Njala College is financed entirely from the Protectorate Mining Benefits Fund, and will continue to be so financed to the end of 1944.

IRRIGATION AND DRAINAGE BRANCH—ANNUAL REPORT, 1943.

BY

MR. C. J. RAE, IRRIGATION AND DRAINAGE ENGINEER.

101. The year 1943 has been to a large extent a transition period during which a general reorganisation of the Branch has been in progress. Early in the year sanction was received to the free grant-cum-loan amounting in all to £303,000 spread over a five-year period, from the Colonial Development and Welfare Fund, and this marked a complete change in the functions of the irrigation and drainage branch from a principally advisory organisation to a constructional one. Combined with this was the receipt during the year of a large amount of heavy equipment, essential for the implementing of the five-year programme, and this involved the organisation of a mechanical works force to operate and maintain this machinery. The reorganisation is now more or less complete, and although suffering on occasion from what may be called "teething troubles" is settling down and steadily becoming more efficient.

102. Pending the arrival of the heavy equipment mentioned above it was decided not to attempt any extensive reclamation work by solely hand labour, as the cost and rate of progress so obtainable was not economic. Thus, development work was largely confined to the completing of works in progress at the end of 1942, and new works were not started until the very end of the year, i.e. after the rainy season.

103. *Construction Work.*—The Rosino project was completed during the year, but owing to delays in completing the main outfall sluice until well into the rainy season, due to labour and material difficulties, it was not possible to bring the whole area under cultivation this year. It became obvious from the effect of drainage and water control over this first area that a considerable change in cultivation methods and seasons would be necessary for the full advantage to be taken of the work done. The Agricultural Department are studying this aspect in detail, and there seems no reason why an effective use of the reclaimed land cannot be achieved.

104. Similarly the Luti project was completed in so far as the flood embankment and main sluices are concerned. The internal drainage is now in progress and should be completed well in time for the 1944 cultivation season.

105. Other minor construction work was carried out by the Agricultural Officers at Makeni and Kenema under the advice and with the assistance of this branch. This work resulted in the most effective control being established over a typical swamp farm at each of these places. It is to be noted that the work at both places has been most carefully designed so as to use no imported materials whatsoever, only material normally obtained by the poorest farmer being used throughout, e.g., palm poles, bamboos, brushwood, etc. Thus these farms are first-class examples for the education of the ordinary farmer into more efficient methods of utilising swamp lands.

106. Apart from the actual drainage work mentioned above a considerable amount of additional, but very essential construction work has been done at Freetown and Rokupr. At Freetown a central store and workshop has been started at Murray Town, just outside the city. A site on the water's edge was obtained about one acre in extent, and a small temporary workshop erected, together with a concrete block store and quarters for a resident storekeeper—watchman. Thanks to the assistance of the military authorities, a telephone connection through military lines was installed. The site in question is exceedingly convenient as a pier, and good harbourage for the branch's motor launches is available immediately adjacent to the store. At Rokupr work has been in progress on a combined office and store for the Assistant Engineer in charge there. Construction on this was seriously delayed due to difficulties in obtaining timber for the roofing, but this has now been overcome and work should be complete in a few weeks. A quarry has been opened near Rokupr for the production of good stone for concrete aggregate, and the newly arrived stone breaking machine installed there. Two blocks of quarters for the European staff at Rokupr are also under construction.

107. *Survey and Reconnaissance.*—This continued throughout the year. The survey of the Yakban drainage area, near Rokupr, was completed before the rains, and the full project for the development of this area was worked out during the rainy season and construction started at the end of the year. The survey of the Robali area, south-west of Yakban, was approximately threequarters completed by the time the rains stopped field work. It was restarted in November and should be completed very shortly. Two smaller areas were also surveyed on the Little Scarcies River, and are ready for construction as machinery and supervision become available. In all approximately 10,000 acres were surveyed during the year. In addition to this major survey work a considerable amount of minor survey in selected upland areas was done, including a very complete

reconnaissance survey of some 7,000 acres in the Batkanu area, where there are possibilities for a useful irrigation scheme. In conjunction with the establishment of tidal gauges on the Great and Little Scarcies Rivers a mean sea level datum was fixed for the whole area, and all past surveys are now being corrected to this common datum.

108. By the courtesy of the Fleet Air Arm, arrangements have been made for the preparation of an aerial photographic mosaic of the Rhombe swamp. This is the large area, extending to some 30,000 acres south of the Little Scarcies River. Its survey in detail by ground operations would be a lengthy and costly business, and it is hoped that with the aid of the aerial mosaic a very large proportion of the ground work will be eliminated, as the photographs will fix all main topographical detail even more exactly than ground survey could possibly do in view of the difficulties of the terrain.

109. During the year the Irrigation and Drainage Engineer and the Senior Assistant Irrigation and Drainage Engineer carried out various treks through the Protectorate on general reconnaissance work and much valuable information has been accumulated.

110. *Collection of Hydraulic Data.*—After a long delay due to the loss of a consignment of water gauges replacements were obtained from India, and these are now being established on various rivers in the Protectorate, in replacement and in addition to temporary gauging stations established during the year. A steady flow of gauge readings is now coming in, and this will enable future design work in the Protectorate, particularly the upland areas, to be based on something better than mere guess work or the information of the "oldest inhabitant" as has been necessary heretofore.

III. *Stores and Equipment.*—The year has been a memorable one from this point of view, as during it all the various items ordered at the end of 1942, when the Irrigation and Drainage Engineer was in the United Kingdom, have been safely delivered. This branch is now well equipped with light and heavy machinery for the effective carrying out of major construction work, including three Newton Chambers half yard excavators, a Bucyrus Erie Bulldozer with six cubic yard scraper attachment, a small sawmill, a stonebreaking machine, and various other items such as pumps, blacksmith's forge, etc., etc. The new launch, *Lady Deidre*, was delivered in May, and has proved extremely satisfactory. She is fast, seaworthy, and, more important still for rainy season use, gives full protection from the weather. The road transport position is now quite satisfactory. The branch has three 30 cwt. lorries, one Hillman pick-up, two motor cycles and four push bicycles. One more lorry is expected to be delivered shortly. In addition to these major items of equipment, an adequate stock of small tools, and general equipment is now available.

112. *Anti-Malarial Work.*—This part of the activities of the branch has become much more important during the year. It was decided that this branch should confine its activities in this direction to purely "consulting" work, the actual construction being delegated to the Public Works Department. All detailed design of drainage schemes for anti-malarial measures is to be done by the branch. Arising out of this change, and the placing of this work high on the priority list, three European surveyors were lent to the branch by the Army, and the survey of the Kissy area, the first to be tackled in detail, was completed. Shortly after the completion of the survey work, however, the surveyors were recalled to army service, and thus survey work stopped *pro tem*. Arrangements

are in hand for their replacement, when survey work in the Cline Town and Brookfields areas will be started. A considerable amount of detailed design work for the Kissy area is completed, and the other is in hand. The military authorities, who are constructing the new Kissy Bye-Pass Road have been supplied with all necessary details to enable them to construct the necessary main catchwater drain along the new road at the same time as the road construction, so that there should be no overlapping of construction work as between road and the anti-malarial considerations.

113. *Establishment*.—During the year Mr. R. L. Akers arrived, on secondment from Malaya, as Senior Assistant Irrigation and Drainage Engineer. Messrs Inglis and Spencer-Knott went on leave, the former in March and the latter in July. Mr. Inglis returned in September, but unfortunately had to proceed on short leave again in November on Urgent Private Affairs. He is still absent, but expected early in the new year. Mr. Spencer-Knott has been held up in South Africa due to passage difficulties, but he too, is expected by the end of January. In February–March the Irrigation and Drainage Engineer was away for some three weeks visiting the Gold Coast at the request of that Government.

114. The branch suffered a severe loss in September by the sudden death of Mr. S. D. Williams, head clerk, from acute septicæmia. He had been with the branch since its inception and was difficult to replace. However, a permanent Second Grade Clerk with Treasury experience, Mr. C. A. Coulson, was obtained after some delay. Credit is due to Mr. C. A. Hollist, second clerk, for his success in carrying on whilst the posting of Mr. Coulson was being arranged.

115. During the erection and testing of the heavy excavating machinery in Freetown, we obtained the loan of a first class mechanical foreman, Sergeant Guy, from the Army. He was only available for some ten weeks, and his departure has emphasised, if that were necessary, the paramount importance of having a really competent European mechanical foreman in charge of the heavy plant. Efforts are being made to obtain one from the United Kingdom.

116. As mentioned at the beginning of this report it has been necessary to recruit a force of African mechanics, fitters, and operators for the heavy equipment. By a process of gradual elimination of the inefficient we now have a small force of reasonably efficient fitters and mechanics and a few competent carpenters. Four young Africans were selected to train as excavator operators, and were given some preliminary training by the Sierra Leone Selection Trust at Yengema, on their excavators, before our machines arrived. Thanks to this generous gesture on the part of the Sierra Leone Selection Trust, these men were partially trained when the machines arrived. One subsequently proved unsatisfactory and had to be discharged, but of the remaining three, one has turned out extremely well, and is obviously going to develop into a first-class operator. The other two, although a little slower in developing are also doing well, and, with added experience, will prove efficient operators. A fourth man, with previous excavator experience, was obtained in lieu of the man discharged, and he is proving quite successful, and will develop into a competent operator as he gains experience on this particular type of machine. Further apprentice drivers are now in training with the two best operators, and it is hoped within the next few months to have at least two complete crews for each machine so that double daily shifts can be worked.

117. During the year the health of the establishment has been surprisingly good, especially amongst the field staff, whose work keeps them for many months in the year in what are probably the most trying and unhealthy parts of the Protectorate. The European staff has kept very fit indeed, and none of them has been in hospital during the year, the only illness being a few very mild attacks of fever amongst the staff in the Scarcies area.

118. During the year the Colony was visited by the agricultural adviser to the Secretary of State, and advantage was taken of this visit to discuss the various problems which had arisen. He visited the Scarcies area and the Protectorate in general, and, in general, approved of the future programme of the branch.

119. It has been found that without full supervision the quality and out-turn of work suffers severely. Two more foremen of works have been approved and are under recruitment; also a mechanical foreman. These officers are badly needed and progress will improve vastly as soon as they are obtained.

ACKNOWLEDGEMENTS.

120. On the eve of retiring from the service of the Colony, I wish to express to all members of the staff who have helped me during the last ten years, my heart-felt appreciation of the assistance they have given me. For ten years we have been a vigorously growing department; the European staff, including the Irrigation and Drainage Branch has increased from ten to twenty-nine; the pensionable African technical staff from twelve to fifty-nine, while ten more are in training; the clerical staff, including temporary appointments, from eight to thirty-five; and the total provision for the department from £14,644 in 1934 to £57,137 in 1944, while, in addition, grants amounting to some £60,000 a year for the next five years have been obtained from the Colonial Development and Welfare Fund for land reclamation, livestock breeding and chemical research work. In addition we are building up a rice milling industry. All this advance, half of it in war-time, has only been achieved by the hardest of work on the part of the whole staff. We have always been, and still are, short-handed owing to the shortage of supply of trained staff, and the war has limited, and still limits, the supply of trained clerks, but nevertheless the department has gone ahead. Mistakes are inevitable when officers are overworked, but whatever our mistakes we can say quite definitely that agriculture is now steadily developing along new lines and that Sierra Leone was better supplied with locally produced foodstuffs at the end of 1943 than at any time during the war, in spite of heavy recruitments of farmers for the Services and service works. This increase in local foodstuffs is what we set out to achieve and it has been achieved; and I thank all the staff who, often under the depressing conditions which so often exist in swamp areas, have so cheerfully worked long hours to bring about this successful result.

I have the honour to be,
SIR,

Your obedient servant,
F. J. MARTIN,

Director of Agriculture.

DEPARTMENT OF AGRICULTURE,
FREETOWN,
18th May, 1944.

